

I IHC Staining in Mohs Surgery

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Mohs micrographic surgery (MMS) is a precise and meticulous outpatient procedure that aims to remove all the cancerous tissue in a particular area of skin while preserving as much healthy tissue as possible, making it ideal for delicate areas such as the face, neck, hands, feet, or genitals, where minimal invasiveness and minimal scarring are desired.^{1,3,4,7}

Mohs surgery was named for Dr. Frederic Mohs, who developed the technique in the 1930s.⁸ It is done by a Mohs-trained dermatologist who performs the surgery and reads the slides on site during the procedure.^{2,5} During the procedure, one thin layer of tissue around the visible cancer is removed at a time.⁴ Each removed layer is immediately fixed, stained, and examined under a light microscope.^{4,6} The Mohs surgeon will examine the margins of the removed tissue for the presence of cancer. If cancer is detected in the margin, then another layer is removed.⁴ This process is repeated until no cancer cells are detected in the removed tissue.⁴ If any residual tumor goes undetected, there is an increased likelihood of cancer recurrence.⁷

Since the patient must remain on site in surgery under local anesthesia until the final clear layer is removed, speed is of the utmost importance in Mohs staining.⁴ To keep slide turnaround as short as possible, tissue sections are fixed via freezing, and staining is performed on frozen sections, for an average turnaround time of 1 hour.^{4,8}

Mohs sections are typically stained via hematoxylin and eosin (H&E) or toluidine blue staining.² However, H&E staining may present difficulties in the interpretation of frozen sections, and so IHC staining may enhance tissue interpretation while sparing additional tissue by reducing variable staining, high background, and nonspecific staining, particularly in cases with dense inflammation.⁶ In cases of poorly differentiated specimens, tumors with dense inflammation, tumors with perineural invasion, and tumor cells in fibrotic or connective tissue around blood vessels or within fascial planes, IHC staining may be used in adjunct with H&E staining to ensure more accurate assessment.^{2,7}

A survey of members of the American College of Mohs Surgery (ACMS) found that the most frequently used IHC stains among Mohs surgeons are MART-1/MelanA, followed by MCK, CK7, SOX10, MITF, S100.²

IHC staining may also assist in the identification of rare and aggressive subtypes of skin cancer, such as melanoma, dermatofibrosarcoma protuberans (DFSP), mucinous carcinoma, lymphoepithelioma-like carcinoma of the skin (LLCS), extramammary Paget's disease, which may require additional treatment or specialized care.⁶

Mohs surgery is an effective and precise surgical technique for the treatment of skin cancer. IHC staining plays a crucial role in this procedure by enhancing the visualization and identification of cancer cells in the removed tissue, helping surgeons remove all cancerous cells while preserving as much healthy tissue as possible.



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